



With distribution supported by

CAE

DUBAI
AIRSHOW

Boeing's bonanza

Bumper first day for US airframer as Emirates and Flydubai lead orders flurry

David Kaminski-Morrow

Major Boeing widebody orders from home carriers Emirates and Flydubai contributed to a busy first day of the show yesterday on which 273 orders and commitments were unveiled.

Emirates has signed an agreement for 90 additional Boeing 777X twinjets, and a revised 787 deal, while its partner airline Flydubai is branching into widebody operations with 30 787-9s.

Follow-on orders from SunExpress, Royal Jordanian and Royal Air Maroc for 737 Max jets and 787s added to a day of strong sales for Boeing, while a fresh commitment from Air Baltic for A220-300s gave Airbus its first business of the show.

Emirates values its part of the Boeing order at \$52 billion. It comprises 55 additional 777-9s, which will be delivered from 2025, plus 35 of the smaller 777-8 which will start arriving in 2030.

Prior to the deal the airline had 115 777Xs on order, part of a

200-widebody backlog which also included 30 787-9s, five 777 freighters, and 50 Airbus A350-900s.

Emirates Group chief Sheikh Ahmed bin Saeed Al Maktoum (*pictured second left*), speaking at the event, said the carrier would be "one of the launch customers" for the 777-8.

He adds that Emirates is "updating" its previous 787 order. The operator had committed to 40 787-10s a few years ago, before rejigging the deal to take 30 787-9s instead.

But Sheikh Ahmed says the airline will have 35 787s, comprising 15 787-10s - revisiting its earlier intention to take the largest variant - and 20 787-8s, opting for the smallest model.

He says Emirates, as a result, will have 295 widebody aircraft on order, including 205 777Xs. To power the 777Xs, the carrier is signing for 202 additional General Electric GE9X engines.

Emirates has a close partnership with Flydubai - including an extensive



F-15 boxes clever

There wasn't a fast pass to be seen as Boeing's advanced F-15 (*pictured*) was put through its paces on the show's opening day, but that was the whole idea behind the display.

Flown by Boeing experimental test pilot Jason Dotter, the 6min-plus sequence was created to showcase the multi-role type's power and fly-by-wire manoeuvrability.

"The entire [display] profile stays inside the 'show box'," explains Boeing test pilot Matt Giese. While some fighters might need to conduct a high-speed pass to regain airspeed, we are so powerful we can stay inside," he explains.

The high angle-of-attack turns on show are not just for effect, however. "We are demonstrating combat capability," says Giese.

Performing the display is one of 36 aircraft delivered to the Qatar Emiri Air Force in the F-15QA standard.

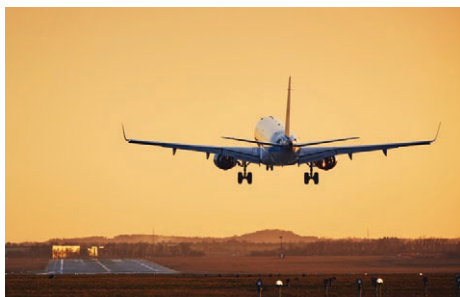
Boeing is currently producing its first operational F-15EX Eagle IIs for the US Air Force, which plans to field 104 examples by 2028. It also is in discussions with Indonesia around a 24-aircraft buy, and promoting the type to Poland, which wants to buy 32 air superiority jets.



BillyPix

BillyPix

Continued on page 3



CIVIL AVIATION

Start every business day with a smarter, simpler operational ecosystem.

CAE

HOW CAN YOU REDUCE MAINTENANCE COSTS AND IMPROVE FUEL EFFICIENCY?

Pratt & Whitney's revolutionary PW127XT engine series is setting new standards in regional aviation. The PW127XT engine series is purpose-built to improve airline economics and sustainability—with a dedicated global team of experts to keep you flying.

Visit RTX at Booth 1080 and at [RTX.com/WeAreRTX](https://www.rtx.com/wearertx)



Continued from page 1
codeshare and co-operation pact – and this was illustrated by the decision by the two carriers to hold a joint event.

Flydubai's agreement to take 30 787-9s is a step up from its previous exclusive use of 737s – both the -800 and the Max versions.

The carrier emerged in 2008 and agreed to take 50 737s before commencing operations, and has since expanded to over 80 aircraft serving more than 120 destinations.

Sheikh Ahmed, who chairs the airline, states that its products have been enhanced to mirror the changing needs of travellers across the region.

He says the decision to take the widebodies is "special, and signals a new chapter for the airline, building on the success of its business model".

SunExpress, which has so far taken delivery of nine out of 42 737 Max 8s already on order, has placed a firm commitment for 45 more. That includes its first Max 10s, of which it is taking 17.

The carrier, a joint venture between Lufthansa and Turkish Airlines, will take delivery of the fresh aircraft order from 2029 through to 2035. It though expects to get its first Max 10 in around 2027, as the airline will substitute some of its existing Max 8 deliveries for the larger type.

The Turkish carrier also took five options and purchase rights on 40 more Max 8s.

Existing 787-8 operator Royal Jordanian ordered six Boeing 787-9s from the manufacturer and is also leasing three more -9s. It will operate these alongside its existing -8s, which it has agreed a deal to refit with Boeing Services. Royal Air Maroc meanwhile reconfirmed an order for two more 787-9s.

Boeing Commercial Airplanes chief executive Stan Deal described the significance of the opening day's business as "pretty darn big".

For its part Airbus announced a fresh pledge from Air Baltic. The Latvian carrier is extending its commitment to the Airbus A220, with an agreement which will take its fleet to 100 of the type by the end of the decade.

It is taking 30 more of the aircraft through a deal which also includes 20 purchase rights.

The airline, which was a launch operator of the A220-300, will begin receiving the first of the next 30 jets from the fourth quarter of 2026.

Udvar-Hazy warns of longer lead times



Graham Dunn

Seven Udvar-Hazy, executive chairman of aircraft lessor Air Lease, believes delivery timelines are likely to change for some airlines given the long lead times in the market currently for future aircraft deliveries.

Udvar-Hazy (pictured) was speaking at the show yesterday during a press conference to highlight EgyptAir's first deal for Boeing 737 Max jets, after it agreed to lease 18 jets from the lessor.

Asked about current demand for widebodies, Udvar-Hazy pointed to the strong recovery in intercontinental travel, noting by way of example that demand on North Atlantic routes "is the highest we have ever seen".

"That has dictated a greater demand for widebody aircraft and what we are seeing now is a surge of demand for widebody aircraft like 787s, 777s, A330s, A350s," he says. "Initially it was primarily for narrowbody aircraft, but now the industry is reaching a greater level of

equilibrium and widebodies have also become extremely sought after."

This though is having a continued impact on the availability of aircraft delivery slots with the manufacturers, compounded by a glut of large aircraft orders as airlines look to secure long-term aircraft needs.

"If you look back at 2021, if you order a plane, Boeing and Airbus would say OK, by 2024 we will have positions. Today as we sit here, positions are not available until the very end of this decade and for certain aircraft types, like the A321neo, it's not even until 2030.

"There has been a massive amount of activity by airlines to line up slots ...from countries like India, Saudi Arabia, the Gulf region, even some of the US carriers," Udvar-Hazy adds.

"Time will tell whether all of these aircraft will deliver on time, and whether the airlines ordering them will be able to absorb them on the timescales that they are thinking about. It will not be surprising if some of those aircraft get deferred to a later time."



A right royal opening

What is becoming one of the most important Dubai air shows in years welcomed its first visitors yesterday. Among them was Dubai's Crown

Prince Hamdan bin Mohammed Al Maktoum (right), who toured the exhibits with Emirates chairman Sheikh Ahmed bin Saeed Al Maktoum

(centre). Dubai's ruler – and UAE prime minister – Sheikh Mohammed bin Rashid Al Maktoum was also in attendance on a busy opening day.

CAeS steps on the gas

Dominic Perry

Canfield Aerospace Solutions (CAeS) has subtly shifted its focus in a bid to take advantage of what it sees as the near-term opportunity offered by fuel cells running on gaseous hydrogen.

UK-based CAeS is developing a hydrogen fuel cell conversion for the nine-seat Britten-Norman BN-2 Islander under a government-backed initiative called Project Fresson.

While this uses gaseous hydrogen, CAeS chief executive Paul Hutton says his assumption was that any "next step" would require more power and more range "and a move from gaseous to liquid hydrogen".

But with the widespread market availability of liquid hydrogen "pushing to the right", Hutton sees a "much bigger opportunity from gaseous" than previously thought. As an initial step, it recently signed an agreement with unmanned cargo aircraft

CAeS has signed an agreement with cargo UAV developer Dronamics, which is exhibiting at the show



developer Dronamics to supply a lower power version of the propulsion system it is developing for the Islander.

Service entry of the hydrogen-powered Dronamics Black Swan is targeted for 2027, shortly after the Islander makes its commercial

debut in 2026, Hutton says.

But based on the speed of regulatory clearance for the new technology, those plans could still change. "We will progress as fast as we can to apply the technology to whichever opportunity comes first," he adds.

Sized at 125kW, the fuel cell system for the Black Swan will allow the UAV to maintain its 350kg (770lb) payload, albeit at the expense of some range, Hutton says.

Dronamics' total requirement is for around 1,300 fuel cell powertrains – a figure

that dwarfs CAeS' existing backlog of almost 100 propulsion systems.

CAeS is present at the Dubai show on the stand of the UAE's Strategic Development Fund (SDF) – an investor in both the UK firm and Dronamics.

In addition, CAeS at the show signed an agreement with Reaction Engines, another SDF-backed firm, to expand their existing collaboration on low-emission powertrains.

Reaction Engines is supplying its low-drag heat-exchanger technology for the Fresson project.

"It's interesting that we are getting technology that was designed for cutting-edge space access but which is going onto a 1960s-designed aircraft," adds Hutton.

Other suppliers for the Islander demonstrator include electric motor specialist Evolito and fuel cell stack developer PowerCell. Hutton says CAeS hopes to firm up the supply chain for the production powertrain "over the next six months".

CATIC gets shipshape

China's CATIC has unveiled a mock-up of a large unmanned helicopter (pictured) that appears to be designed for shipborne use.

The helicopter is designated AR-2000 and features an electro-optical/infrared sensor in a chin station, and a housing for a surface search radar beneath its fuselage.

The helicopter's rotors are in a folded back position, suggesting a shipborne role. It also features stub wings, although no armaments are mounted. The model's relatively featureless appearance suggests the helicopter may still be at the conceptual stage. CATIC officials declined to comment about the AR-2000 or other models on the company's stand. CATIC is the export arm of Chinese state airframer AVIC.

Alongside the AR-2000 is a smaller unmanned air vehicle (UAV) designated AR-500W. China's state-run Global Times news outlet reported that this was displayed at the

IDEX defence show in Abu Dhabi in February.

In addition to the two unmanned rotorcraft, CATIC's stand features models of several fixed-wing UAVs, including the heavily armed Wing Loong WL-X. The jet-powered, V-tailed type is depicted carrying 16 weapons – eight bombs and eight missiles.

A model of the Wing Loong II shows it with a synthetic aperture radar pod under its centerline, along with bombs and rockets.

The company is also showing a model of the Harbin Z-20 utility helicopter, an in-service type that resembles the Sikorsky UH-60, as well as a Z-10ME attack helicopter.

Chinese aircraft are also present at the show. China's August 1st display team, equipped with the Chengdu J-10C, is performing in the flying display. The Chengdu/Pakistan Aeronautical Complex JF-17 is appearing in both the flying display and in the static park.



Super Tucano's new lease of life

Widely flown by air forces on five continents and with more than half a million flight hours beneath its wings, Embraer's combat-proven A-29 Super Tucano (pictured) is ready for its latest evolution: a dedicated variant optimised for use by NATO nations.

Embraer launched its A-29N development programme earlier this year, with potential roles including light combat or counter-insurgency operations, reconnaissance, and supporting joint terminal attack controller training. Its aim is to attract the first buyers for the Super Tucano in Europe.

In May, Embraer Defense & Security chief executive Bosco da Costa Junior revealed an objective to secure a first order for the A-29N before year-end. The company had already demonstrated the

new model to several interested parties.

"Now I'm more optimistic about it," he tells FlightGlobal. "We are in very good shape to have a launch customer for the A-29's NATO version."

Embraer officials will not comment further about a potential buyer, but have previously identified prospective customers as including NATO members the Netherlands and Portugal, along with non-aligned Austria.

Da Costa Junior expects interest in the NATO-optimised asset to take off after initial examples have been handed over.

"I think that when we have delivered the first aeroplane and see it in a real operation many other countries will see the value of it," he says. "I think we are going to have success."



PRECISION WITH EVERY MISSION

At EDGE, our families of advanced UAVs embody precision in every mission. From REACH-S our Medium Altitude Long Endurance drone, to JENIAH our Unmanned Combat Aerial Vehicle, we ensure your decisive edge in remote operations with unwavering precision. Delivering autonomous advantage and keeping your valuable human assets ever safer.

Discover how we achieve precision with every mission at edgegroup.ae



Going for a spin: a UAE helicopter flotilla



Only way is up: Calidus B-250



Fighting Falcon: UAE F-16



Smoking: Italy's Freccia Tricolori



Display time

Air shows give manufacturers, air forces and airlines a chance to show off their products in the environment they were designed for – the skies. Our photographers captured the highlights from the opening day



Contrail-blazer: HAL Tejas



Big Boeing: 777-9



Flare game: Boeing C-17



Star turn: Dassault Rafale



Transport of delight: Airbus C295



Superjumbo and friends: Emirates A380 and Al Fursan display team



Still Boeing strong: 777-300ER



Widerbody: Etihad A350-1000



Tanks for the memory: A330 MRTT

Photography: BillyFix

KC-46 is 'all military'



The tanker on the static display

Greg Waldron

Boeing sees opportunities for the KC-46 tanker in the Middle East, stressing that the 767 derivative is designed as a military aircraft from the ground up.

In a briefing aboard a US Air Force KC-46 in the static park yesterday, Boeing business development executive Sean Martin said there has been significant interest in the tanker regionally.

"We are seeing a very increased desire for the

capability in this region... the capability is the right size, the right fit for this region," says Martin.

He listed several attributes that the company feels make the KC-46 a better option than airliners that are converted to tankers, such as having "hardening" baked in during the production process.

He says the KC-46 can withstand electromagnetic pulses that can be caused by nuclear explosions, and which render electronics unusable. The aircraft is also resistant to small arms

fire, and can operate in an environment that has been compromised by chemical warfare.

Moreover, the aircraft can operate in what he calls "covert mode", whereby it uses no visible light during nighttime operations.

The USAF has taken delivery of 76 examples from a total order of 179. The service had been eyeing a "bridge tanker" requirement, also known as KC-Y, as it continues to replace its Boeing KC-135 fleet.

Lockheed Martin had been teamed with Airbus

Defence & Space to offer the A330 Multi-Role Tanker Transport (MRTT) for the contest, which it was calling the LMXT. However, the US airframer recently withdrew its bid, potentially opening the way for additional KC-46 sales.

Martin notes that Boeing will be supporting the KC-46 through to at least 2040. "We'd like to think that we are a great platform that's out there doing missions every day for the air force, and we'd love the opportunity to continue to do that... but the [Department of De-

fense] and the air force will make that decision."

Martin says that progress is being made on the jet's troubled remote vision system, which allows operators sitting behind the cockpit to refuel receiving aircraft using screens and 3D goggles.

The new system will present refuelling operators a more realistic picture of receiving aircraft. A critical design review of 'RVS 2.0' is pending.

Previous USAF reviews of the platform revealed a string of deficiencies, the most serious of which are rated as Category I. The Pentagon describes a Category I deficiency as any fault "that could cause loss of life or catastrophic failure of a major weapon system" - the aircraft's RVS system accounts for two Category I deficiencies.

"When you look at it from a numbers standpoint, the numbers are really not that drastic from a Category I standpoint," says Martin. "The good part of it is that we are working through them."

An additional four Category I items are related to aircraft systems. "All of the deficiencies have a clear path to closure," says Boeing.

Martin would not be drawn on the potential for the UAE to order the KC-46. The country had an apparent interest in the type in 2019 to complement its three Airbus A330 MRTTs, but in 2021 decided to obtain two more of the type.

Cirium fleets data suggests that Saudi Arabia might have a requirement for new tankers. While it has six new MRTTs, it also operates seven KE-3As, a derivative of the 707, with an average age of 37.2 years.

Overseas debut for KAI helicopter pair

Korea Aerospace Industries (KAI) has brought two helicopters to the Dubai air show, the first time it has taken rotorcraft to an industry gathering outside South Korea.

The company is showing a KUH-1 Surion - rebadged 'KUHE001' for export - and a Light Attack Helicopter (LAH) in the static park. A Surion is also performing in the flying display.

This is the international debut for both helicopters, which have been a feature of the Seoul ADEX defence show in recent years.

The Surion in the static park is also shown with a mock-up of an external weapons package that includes ground-attack missiles and rockets.

JungMoo Yang, senior manager in KAI's rotorcraft business team, says there is significant interest in both types in the Middle East.

The company says it wants to highlight that the Surion can perform a number of missions, including the key utility and attack roles.

But the Surion has yet to secure overseas sales. In South Korea, the army operates the helicopter in the utility role, while the nation's marines operate the MUH-1 Marineon and will operate an attack variant in the future.

Several parapublic agen-

cies in South Korea also operate versions of the Surion. The smaller LAH is derived from the Airbus Helicopters H155 medium-twin. In August, the European air-

framer and KAI announced they would launch series production of the LAH with deliveries to the South Korean army to commence in 2024.



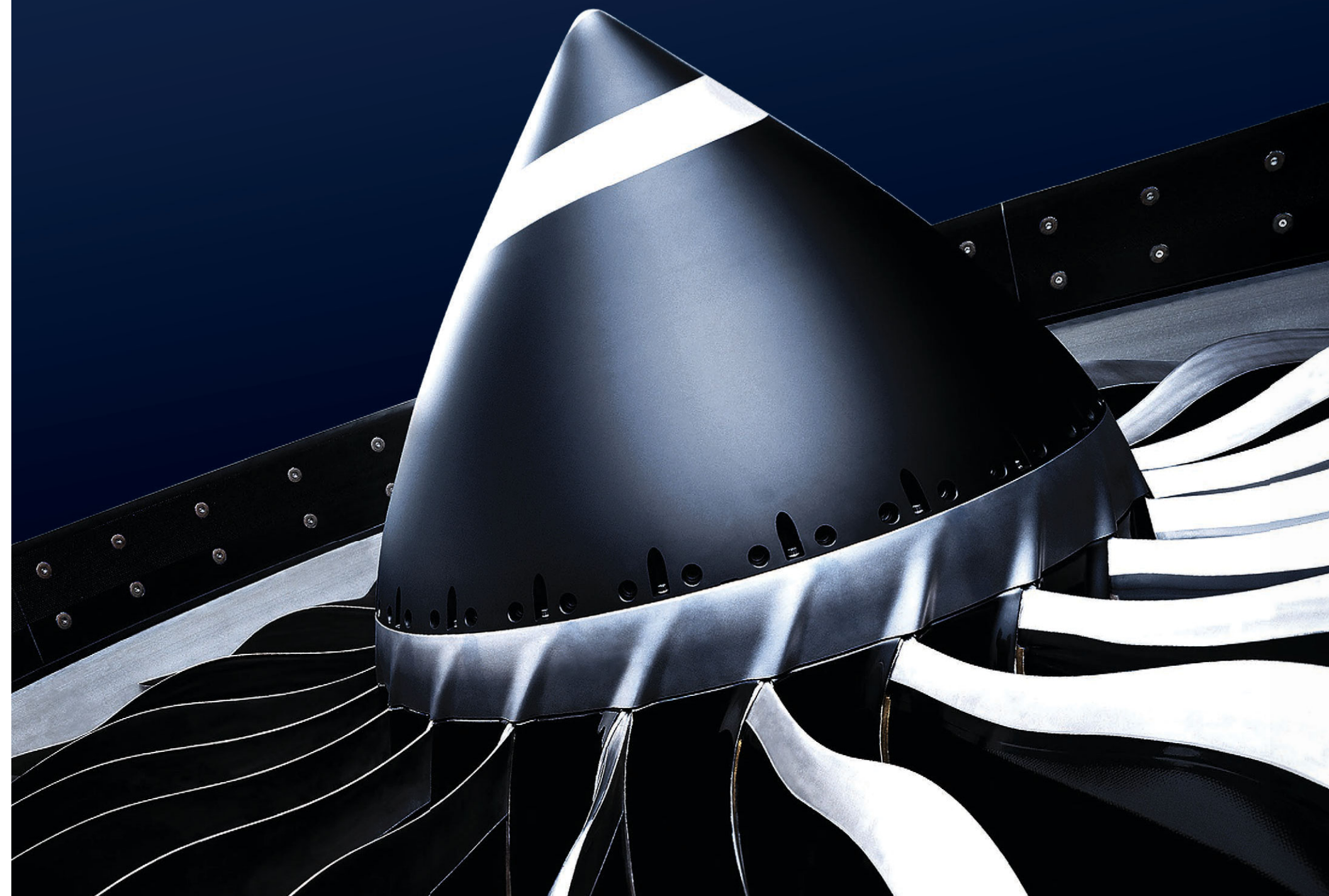
KAI is displaying the KUH-001 Surion with a range of potential armaments

KAI has some experience doing business in the Middle East, with the Iraqi air force operating 24 T-50IQ advanced jet trainers.



The future is our starting point

Every day, we're working to help move the world forward. Today, and for generations to come. The future of flight starts now.



GO BEYOND

Meet our all-new long-distance leader. Reaching 8,000 nm/14,816 km¹ at Mach 0.85, the Gulfstream G800™ takes you farther faster, guided by the award-winning Symmetry Flight Deck.



Gulfstream™

A General Dynamics Company

¹NBAA IFR theoretical range at Mach 0.85 with 8 passengers, 4 crew and NBAA IFR reserves. Actual range will be affected by ATC routing, operating speed, weather, outfitting options and other factors. All performance is based on preliminary data and subject to change.



MEET THE GLOBAL DEFENSE INDUSTRY

World Defense Show 2024 is your destination to connect, collaborate and network with industry leaders and shape the future of security and defense. Get equipped for tomorrow and take part in this unmissable show.



SCAN TO REGISTER TODAY

Saab set for final UAE GlobalEye delivery



The GlobalEye is taking part in the flying display at the show

Craig Hoyle

Saab is close to performing the debut flight of its fifth and final GlobalEye surveillance aircraft for the United Arab Emirates, while it scans for additional sales.

The UAE is launch operator for the Bombardier Global 6000-based system, having signed for an initial three at the 2015 Dubai show. Uniquely, the platform can monitor airborne, maritime and land-based targets simultaneously.

"The UAE programme is on status and on track: it's basically full speed ahead," says Tomas Lundin, Saab's head of marketing and sales for airborne early warning and control (AEW&C). "We did the first flight for

the fourth Global aircraft in April this year and it's now in the final test phase, and for the fifth aircraft we're going to do the first flight rather soon."

Both assets will be delivered from Saab's Linköping site in Sweden during 2024. At the show, the manufacturer is exhibiting a virtual reality tool, which shows off the aircraft and its interior - by invitation only. "We also have a mission operator room where we can sit down with selected guests and look at some demonstrations and different concepts of operation," Lundin says.

The company also is under contract to produce two GlobalEyes for the Swedish air force, with options on a further pair. Deliveries will occur in 2027, to replace two Saab 340-based AEW&C platforms.

"The green aircraft are in production, and there are

lots of ongoing activities in relation to the mission system," Lundin tells FlightGlobal. "We will soon start to receive the green aircraft."

South Korea is another current focus of attention for Saab, with a request for proposals linked to its four-aircraft AEW&C 2 requirement expected soon.

"We are offering a 360° primary radar coverage solution," Lundin says. "We do an adaptation to have a front- and aft-looking radar, as part of the configuration," he adds: these are in addition to its roof-mounted Saab Erieye ER sensor. "We have a fully compliant solution that we are prepared to offer, together with a strong industrial package."

Competition will come from the Boeing 737NG-based E-7 - a type already

operated by the Republic of Korea Air Force. A 360°-capable version is also being offered to NATO, which is seeking a successor for its aged Boeing E-3 airborne warning and control system (AWACS) fleet.

"We are looking forward to the next step, and we are prepared," Lundin says.

The company also has already conducted demonstration flights for E-3F operator the French air force.

Future customers would field modified Global 6500s.

Meanwhile, Warsaw recently received its first of two Saab 340 AEW&C aircraft via a rapid acquisition. "We are really excited to deliver those assets, but Poland is very interested in GlobalEye as well," Lundin says.

"We have a lot of ongoing activities," he adds. "We facilitate discussions with for example Denmark and

Finland, to look at an opportunity to bring on board more countries in the Nordic region. That stretches out to the Baltic Sea and to the Baltic countries."

Back in the Middle East, with Saudi Arabia currently operating the E-3 AWACS, and Qatar having previously expressed interest in acquiring an AEW&C capability; could either be potential candidates for a future GlobalEye sale?

Lundin declines to comment, but notes: "We are always looking at new business opportunities - absolutely also in this region."

"We pride ourselves in having something here and now - something that is in production, in operation and under contract. I think that resonates well with the market."

In brief...

Saudia APU service deal

Honeywell has appointed Saudia Technic as its first authorized service centre in the Middle East for the 331-500 standard auxiliary power unit on Boeing 777s. As part of the 10-year agreement, Jeddah-based Saudia Technic, formerly Saudi Arabian Aerospace Engineering Industries and owned by the national airline, will provide APU inspection, repair, overhaul, and upgrades. Honeywell says the arrangement means an MRO facility will be available to 777 operators in the region for the first time.

Eve to supply ATM know-how for Dubai vertiport

Electric vertical take-off and landing aircraft developer Eve is to supply its air traffic management (ATM) system to Swedish vertiport developer Kookiejar to support vertiport operations in Dubai, under a letter of intent announced yesterday at the show.

The agreement marks Eve's first ATM agreement in the emirate, while Kookiejar becomes the tenth customer for the technology worldwide.

Kookiejar, along with local partner Air Chateau, is preparing to unveil its vertiport concept, with eight parking pads and final approach and take-off zone, at Dubai's second airport, Al Maktoum, next to the show site.

"Urban air mobility relies on infrastructure within the lower air space as well as accessible take-off and landing spots - vertiports. Eve's urban ATM solution provides an integrated suite of software that will enable an efficient and predictable eVTOL ecosystem," says Rob Weaver, urban ATM global business development lead at Eve.

Melbourne, Florida-based Eve is showing its eVTOL cabin mock-up in the advanced air mobility pavilion. It seats four in a club layout, behind a single-pilot cockpit.

A week ago, the Embraer spin-off said that it was assembling its first prototype ahead of a planned 2024 flight-test campaign.



The cabin concept is on show in the AAM pavilion

Dominic Perry

Chinese aircraft developer AutoFlight expects to secure certification in the coming months for an unmanned cargo variant of its electric vertical take-off and landing (eVTOL) design. Called CarryAll, the aircraft will be able to transport a 400kg (880lb) payload on routes of up to 135nm (250km).

Certification from the Civil Aviation Administration of China (CAAC) is anticipated "in the next few months", says Mark Robert Henning, managing director of the firm's Augsburg, Germany-based subsidiary AutoFlight Europe.

Crucially, service entry of the cargo aircraft will pave the way for regulatory acceptance of Prosperity, its follow-on manned passenger aircraft, a mock-up of which is on the Dubai static display.

"We will have hundreds of aircraft out there producing data from daily operations; it will be much easier for the regulator to accept."

Using the same lift and cruise architecture as the CarryAll, Prosperity can accommodate four passengers and a single pilot, with the same 135nm range as the cargo variant.

AutoFlight currently has three proof-of-concept aircraft flying in China - one is currently engaged in high altitude tests - with the first Prosperity prototype due to

AutoFlight set for cargo go-ahead



The Prosperity model on the static

take flight in 12-18 months' time, says Henning.

Chinese certification is targeted for late 2026 or early 2027, with European approval to follow at least 12 months later.

Unlike many of its rivals, AutoFlight has decided on a strategy of vertical integration in a bid to cut costs:

the electric motors, battery packs, airframe, energy management system and power electronics are all internally developed and produced, says Henning.

With hundreds of would-be manufacturers all bidding to take a piece of the eVTOL market, Henning is convinced that AutoFlight's

"differentiator" will be "affordability".

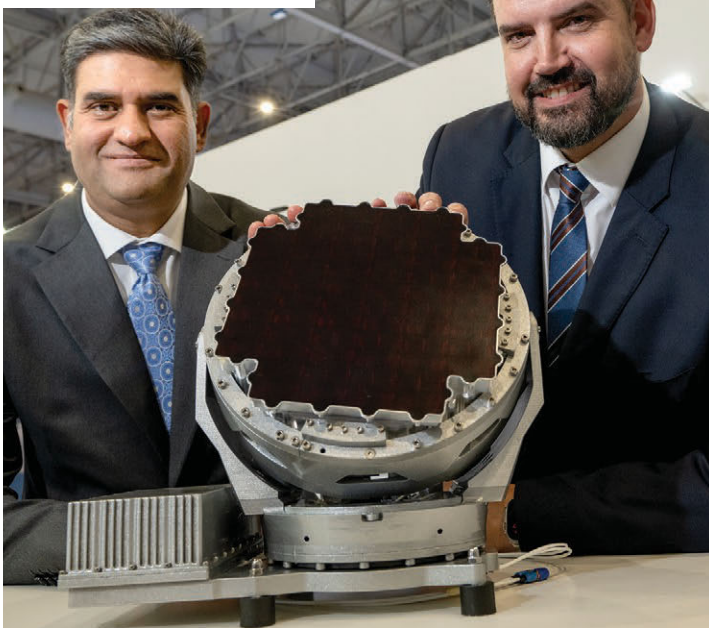
Scaling production will help to drive down costs, Henning adds. He argues that Prosperity's architecture will also enable costs lower by "a factor of two" than those of its rivals due to a lack of complexity.

Rather than a tiltwing or

tiltrotor design, the aircraft features 10 direct-drive propellers for lift and two rear-mounted propellers for cruise flight.

At the show, AutoFlight signed an agreement with Abu Dhabi-based Falcon Aviation Services to collaborate on shaping advanced air mobility services in the region.

Empire's Paras Dhamecha with Dave Falberg of Satcom Direct



SD Ku-band for Empire

Empire Aviation has been announced as the first UAE operator to deploy the Plane Simple Ku-band terminal from Satcom Direct (SD)

The line-replaceable unit - comprising a tail-mount-

ed antenna and SD modem is being equipped on a Bombardier Global XRS by MRO firm ACC Columbia Jet at its Hamburg site. Empire will take delivery of the large-cabin jet in late November.



ArcosJet joins the Lilium Jet-set

Lilium has secured a firm 10-unit order for its Lilium Jet (cabin mock-up pictured above) from recently appointed Dubai-based dealer ArcosJet and has also quietly upped the quantity of Pioneer Edition jets it intends to build.

Deliveries of the electric vertical take-off and landing (eVTOL) aircraft - all of which will be four-passenger Pioneer Edition jets - will start in 2026, says ArcosJet's Yuri Dzun.

"We already have a lot of interest in it from our customers," he says. "They are really excited to learn about it; the cabin is fantastic, it really provides the feeling of a jet."

Dzun is confident that it can sell all 10 aircraft within 18 months. The deposit-backed agreement is a sign of the dealer's confidence in the product, he adds.

"We are very proud about this agreement for a number of reasons, not least that ArcosJet is a solid aviation company", with billions of dollars of deals behind it," says Paul Frank-Bijou, vice-president of business development at Lilium.

ArcosJet is the exclusive authorised dealer for private sales of the Lilium Jet in the UAE, Israel and Cyprus. Lilium had originally planned to build 50 examples of the Pioneer edition jet but having already taken orders for 46 aircraft it has now extended this to 80 units, says Bijou.

Featuring a four-seat club layout, the "high-end" Pioneer cabin is aimed at individual owners prepared to pay the \$10 million price tag for the variant. Although this is around \$3 million more than the baseline six-seat shuttle model of the eVTOL, the cost also includes a comprehensive service and support package.

Meanwhile, Lilium continues to be in contact with senior management at fractional operator NetJets, which in 2022 signed a tentative agreement for up to 150 Lilium Jets.

"They are waiting for the aircraft to fly," he adds - a milestone currently expected for the second half of 2024. "I met with them recently and they are very happy with the partnership we have."

CIVIL AVIATION

Start every business day with a smarter, simpler operational ecosystem.

CAE Civil Aviation offers Flight Operations Solutions to unify, simplify, and optimize efficiency across the breadth of your operational systems and processes. From crew, airport and in-flight management, to OCC workload optimization, enhanced ground ops and beyond, CAE's highly-advanced and evolved suite of digital aviation solutions connect and empower your teams, enabling them to better deliver on your brand promise.

Visit us at booth #1035 | www.cae.com



Sustainable aerospace together



The pursuit to build a brighter tomorrow is in all of us—and now is the time for action. We are enacting changes to reduce emissions and activate an ecosystem of aviation, energy, finance and policy that will support progress. Net zero will require all of us working together as we pursue the next horizon—safely and sustainably.

Learn more at sustainabilitytogether.aero



GA-ASI to integrate EDGE weapons onto SkyGuardian

General Atomics Aeronautical Systems (GA-ASI) will integrate smart weapons produced by United Arab Emirates defence producer EDGE with the MQ-9B SkyGuardian unmanned air vehicle (UAV).

The agreement, signed at the show yesterday, will see the two companies integrate EDGE's Thunder series of guided bombs and Desert Sting series of glide weapons. The Al Tariq series of weapons will also be integrated.

The project will mark the first time that GA-ASI has integrated non-NATO weapons with one of its UAVs.

"We are proud to be working with General Atomics Aeronautical," says Hamad Al Marar, president of EDGE Group's Missiles & Weapons cluster.

"The opportunity to integrate our smart weapons on the MQ-9B SkyGuardian will offer the end user multiple dynamic, highly accurate, and cost-effective ground strike solutions. We look forward to working closely with General Atomics Aeronautical on this programme and to enhancing our collaboration in the future."

EDGE is showing its Thunder and Desert Sting glide weapons at the show



The aircraft is on display by only in model form

Kawasaki talks up C-2

Kawasaki is promoting its C-2 transport to the international market, as it eyes global opportunities for its twin-engined airlifter.

The Japanese company has a relatively large presence at this year's show, with a Japan Air Self-Defense Force C-2 having appeared on static in 2017 and 2019.

The aircraft has a maximum take-off weight (MTOW) of 141t, which places it roughly between the Lockheed Martin C-130 and out-of-production

Boeing C-17.

The C-2 can carry 110 personnel using seats along the fuselage wall and with a central bank of seats. When not being used, the centre seats can be stored in the forward cargo compartment or on the cargo ramp. The company boasts that it has more space between seats than other transports.

Powered by two GE Aerospace CF6 turbofans, the C-2 offers a maximum cruising altitude of 45,000ft and can fly at Mach 0.8 – considerably higher and faster

than turboprop-powered transports.

A company brochure shows that an aircraft departing from Riyadh can carry a 32t payload as far as the Nordic countries, and a 20t payload as far as Southeast Asia.

The aircraft can be refuelled via a boom. Its fuel tanks have explosion suppressant foam.

"When there is a possibility of being shot, the aircraft is operated with the centre tank empty," says Kawasaki.

FLIGHT DAILY NEWS

Produced by FlightGlobal, 1st Floor, Chancery House, St Nicholas Way, Sutton, Surrey SM1 1JB, UK

©2023 DVV Media International

HOW TO CONTACT US

We are located in the show dailies area on the first floor by the exit to the static display

Editor Murdo Morrison murdo.morrison@flightglobal.com

Executive Editor, Flightglobal Graham Dunn graham.dunn@flightglobal.com

Reporting team Craig Hoyle, David Kaminski-Morrow, Dominic Perry, Greg Waldron

Production Louise Murrell

Designer Sarah Eversfield

Picture editor James Robbins

Photography Tom Gordon

Distribution Stuart Burgess, Dawn Hartwell

Divisional Director, FlightGlobal Sophie Wild

Printers Emirates Printing Press, Dubai

Boeing picks up pace on digital transition

Murdo Morrison

Twenty years after introducing electronic flight bags for airliner pilots, Boeing is "hitting the accelerator pedal" when it comes to its digital transition.

That is according to Brad Surak, recruited in January as Boeing Global Services' vice-president of digital aviation solutions to spearhead the airframer's efforts to "build a world-class software business".

Boeing's digital offering has its roots in two acquisitions. Boeing bought aviation mapping firm Jeppesen in 2000, transforming its paper-based products into a navigation and flight planning software specialist. In 2019 it added mobile platform provider ForeFlight.

Now Surak – who previously worked for Hitachi and GE Digital as well as start-up Turntide Technologies – is ready to take the next step. "I came in to put a growth strategy in place," he



Surak: Everything we do is fleet agnostic

says. "I think we can add a whole lot more value."

That evolution will involve using artificial intelligence, machine learning and "big data" sets to create integrated software products that help airline, military and business aviation customers "operate more safely, sustainably, and efficiently", says Surak, speaking to

FlightGlobal ahead of the show.

"Traditionally a lot of software products in aviation have been isolated and niche. What we are doing is bringing it together into integrated portfolios aligned to a customer's digital journey," he adds. "We are looking at it in terms of outcomes rather than from an individual product point of view."

One of the so-called bundled offerings is Fleet Insight, a cloud-based application offered under the Jeppesen brand that includes information such as live and scheduled flight plan data, weather displays, and NOTAM updates, together with more than 1,000 airport maps.

Surak stresses that Boeing is pitching its offering to the entire industry and not just operators of Boeing aircraft. "Everything we do is fleet agnostic," he says.

"We are positioning ourselves as an innovation partner...helping customers drive their digital transformation."

CelestialStar of the show

Lufthansa Technik unveils finished cabin concept for 777-9 BBJ

Dominic Perry

Lufthansa Technik (LHT) has revealed the final part of its new CelestialStar cabin concept for the Boeing Business Jets 777-9, a design it sees as ideal for the Middle East head-of-state market.

The German completions house had already teased the unnamed concept at the EBACE and NBAA business aviation shows in May and October, respectively, but said it was waiting until the Dubai air show to unveil the full details of the design and branding.

It says the CelestialStar interior "combines traditional influences from the Middle East's cultural heritage with a modern twist" and is "specifically tailored to the requirements of a new generation of VVIP and head-of-state aircraft".

While much of the concept had been previously disclosed, details of the forward VVIP cabin and lounge area adjacent to the main cabin entry doors had remained a secret.

The private suite takes



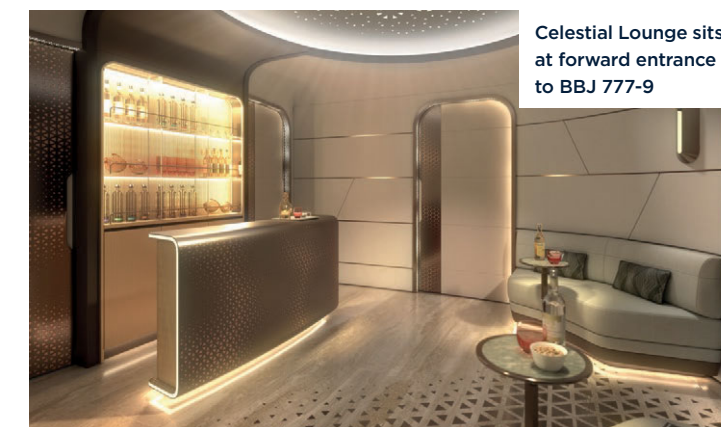
VVIP suite includes private bedroom

up the forward part of the CelestialStar design and incorporates a private bedroom, bathroom and "work and balance" area.

That borders the "Celestial Lounge", which is outfitted with an "elegantly integrated bar for refreshments and several stylish seating arrangements".

The design "ensures the perfect first impression and provides the adequate setting for welcoming high-ranking guests on board or preparing them for meetings".

If the corridors are open, the lounge area "merges



Celestial Lounge sits at forward entrance to BBJ 777-9

almost seamlessly" into the adjoining conference and dining area, which features

11 individual seats which can be easily repositioned as required.

The windows are fitted with electrochromatic dimming – a concept first introduced on the 787.

"The BBJ 777-9 is the largest aircraft type newly available on the market and thus simply predestined for its role as successor to the BBJ 747 as the most popular aircraft for heads of state, many of which are among our loyal customers for decades," says Hassan Gasim, sales director Middle East VIP & special aircraft services at LHT.

He says sister carrier Lufthansa's position as launch customer for the 777-9 has enabled the completions unit to "build up extensive technical expertise at an early stage".

Lufthansa Technik says close co-operation with Boeing and its provision of up-to-date aircraft data has ensured "the technical feasibility of the design from the outset".

The CelestialStar concept also features six deluxe suites – first-class compartments – for high-ranking ministers, 32 business-class-standard seats in the "executive area" and a premium-economy cabin at the rear for the wider retinue.

At last month's NBAA show, LHT indicated that if Boeing maintains its current 2025 service-entry goal for the commercial 777-9, a jet outfitted with the CelestialStar cabin could be delivered to a customer by 2026 or 2027.

US aerospace must be ready to respond, says AIA

The US government must ensure its aerospace industrial base can respond rapidly to changing military requirements as international tensions intensify. This is after the pandemic, inflation, and labour and material shortages have weakened many businesses.

Advocacy body the Aerospace Industries Association will make that plea this week as it meets with US officials at the air show. The conflict between Israel and Hamas, the Ukraine war, and Beijing's aggressive posturing are heightening global instability and prompting calls for increased military spending.

"It is an opportunity to remind our government that it needs to have an industrial base it can dial up faster," says AIA chief executive Eric Fanning.

The AIA says it is supporting dozens of its members exhibiting at the show, for whom the Gulf and much of the wider Middle East is a major market – both on the defence and commercial side – by facilitating meetings and round table discussions.

"Our job at an event like this is to be a lynchpin, a link between industry and governments," says Fanning, who served as Secretary of the Army and Acting Secretary of the Air Force under President Obama.

Fanning believes the supply chain crisis that has afflicted the aerospace sector since the Covid-19 period is "getting better" but will "take a long time to get out of".

The problems with supply have sparked a debate on the merits of aerospace companies

outsourcing production. "It can create a very efficient supply chain, but not one that is always resilient," says Fanning. "When Covid hit, it showed that having a global supply chain can be a form of resilience but also a weakness."

Links with China illustrate the dilemma. While there is considerable pressure for US firms to "decouple" their industrial relationships with Beijing as a potential adversary, for many firms in commercial aviation, the country represents an "enormous market", he says.

The wisdom of fixed-price defence contracts, fashionable at a time of stable prices and interest rates, is also under scrutiny, suggests Fanning. "Governments tend to protect the taxpayer from inflation by seeking fixed-price contracts, but that puts all the cost on industry," he says.

"Fixed-price contracts are fine for products that are fully developed in the price cycle. But when there is a lot of uncertainty over the development, it puts all the risk on the supplier. That could end up decreasing innovation and competition and even driving companies out of the market."

He adds: "Our purpose is to make sure the US government plays its part to make sure this very important industry is globally competitive and innovative."



Fanning: Need to ensure US aerospace is globally competitive and innovative



The Gulf's two leading low-cost airlines have followed distinct growth trajectories, but where do Flydubai and Air Arabia go from here?



Dynamic duo

Flydubai: Mission to connect places Dubai was not connected to

Be Part of Transformation in Aerospace

Convene with aviation's finest. Discover cutting edge innovations. Participate in strategic conversations.



Flying & Static Displays



Trade Programmes



Sustainable Aviation & Advanced Air Mobility Forums

Register for a Trade Pass Today!

Enjoy early bird rates when you register as a trade visitor by 30 November 2023.



Scan To Register

www.singaporeairshow.com/register



SINGAPORE AIRSHOW 2024 20-25 Feb
WHERE AVIATION'S FINEST MEET

Organised by: **experia** events that influence
Strategic & Knowledge Partner: **AVIATION WEEK NETWORK**
Supporting Media Partner: **AIN**
Business Intelligence Partner: **SHEPHARD**
Supported by: **SG**
Made possible in: **SINGAPORE** Passion Made Possible

Murdo Morrison

The United Arab Emirates' two home-grown short-haul airlines have come a long way since their foundation - 15 and 20 years ago, respectively - as supposedly low-cost upstarts. Both are following their own growth strategies as they bounce back strongly from the Covid-19 downturn, expand their route maps, and edge towards three-figure fleet sizes.

Flydubai, founded in 2008, may have once described itself as a low-cost airline, but with its plush headquarters in Dubai's developing eastern outskirts, freshly minted code share agreements with two leading North American operators, and an improved business class product destined for its Boeing 737 Max and NG fleet, there is little no-frills about Emirates' independent sibling.

Chief executive Ghaith Al Ghaith recalls when his boss Sheikh Ahmed Al Maktoum - who chairs Flydubai and Emirates - was asked at its unveiling if Flydubai would be a low-cost carrier. "His Highness's response was: 'It will be Flydubai'." Al Ghaith insists that uniqueness holds true today. Flydubai was not modelled on any airline and remains "completely distinct" from Emirates, he says.

Al Ghaith describes Flydubai's mission as "connecting Dubai to places it was not connected to",

complementing the all-widebody offering of Emirates, which Flydubai code shares with on about 30 routes. Flydubai serves around 120 destinations - including 20 introduced this year - about three-quarters of which do not overlap with Emirates.

Two of the latest - inaugurated on 29 October - are Cairo Sphinx International and Poznan, with Flydubai becoming the first UAE carrier to operate directly to these airports. The airline already flies to the Egyptian city of Alexandria as well as Krakow and Warsaw in Poland. Flydubai is also resuming a double-daily service to Kabul in Afghanistan from tomorrow (15 November).

Just 25km away from Flydubai's Dubai International hub, Sharjah's Air Arabia has adopted a different expansion path since its foundation in 2003. A core part of the all-Airbus A320 family operator's philosophy has been establishing joint ventures with local partners in Armenia, Pakistan, and the UAE emirate of Abu Dhabi, where it partners with Etihad. It also has offshoots in Egypt and Morocco.

Chief executive Adel Ali too is reluctant to describe the carrier as low-cost, despite its single-cabin product. "My belief is that the term low-cost carrier is about how you manage cost and not about the customer experience. The customer needs to be satisfied and feel that they have had value for money," he says.

Like Flydubai, Air Arabia has been adding routes in recent weeks, including from Sharjah to Sphinx International near Cairo from 6 December. The service is Air Arabia's fourth in the country - it already flies to Cairo International, Borg Al-Arab and Sohag. In January, it will launch a thrice-weekly route from Abu Dhabi to Colombo in Sri Lanka.

The airline operates 11 aircraft from the UAE capital, launching its operation there in July 2020 at the height of the pandemic. "We were invited by Etihad to provide routes

to feed their long-haul operation, although most of our traffic there remains point-to-point," says Ali. "Because of when we started, the first 12 months were difficult, but things are improving."

Around the time Air Arabia began its Abu Dhabi operation, Hungarian carrier Wizz Air launched its own spin-off in the UAE capital, serving routes in eastern Europe as well as the Middle East and central Asia. However, Ali says Wizz Air's "ultra-low cost" product means "we are not really competing with them", adding wryly: "People can have an enjoyable trip with us."

While his aspirations are modest for Air Arabia's year-old, two-aircraft Armenian venture, Fly Arna, Ali has high hopes for co-owned Pakistan airline Fly Jinnah, which began flying domestic routes last year. Its three aircraft are achieving load factors of 94%, and Ali plans to increase the fleet to five by the end of the year, as well as seek approval to launch international services from its Karachi hub.

A Sudanese joint venture with local conglomerate DAL Group, announced last year, is on "long-term hold" following political upheaval in that country. However, Ali says there is still potential for other initiatives within and outside the Arab world. "We will look at each case, and if a good business opportunity comes up, we will take it," he says.

Both Flydubai and Air Arabia



Al Ghaith has headed Flydubai since its foundation



Air Arabia has maintained 80%-plus load factors this year

Oleksander Naumenko/Shutterstock

are in the middle of extensive fleet renewals. Air Arabia has 71 aircraft, all powered by CFM engines, including nine A321LRs. At the 2019 Dubai air show it ordered 120 A320neo family jets, including 27 A321LRs and 20 A321XLRs. Although Air Arabia intended to begin taking deliveries of those aircraft next year, Ali says 2025 is now a more realistic start date.

The LR - with their 4,000nm (7,400km) range - have allowed Air Arabia to introduce flights to the likes of Bangkok, Kuala Lumpur, and Milan. The XLRs will allow deeper penetration into Africa, Southeast Asia, and Europe, including the UK, says Ali. "If you are a UAE carrier, you have to go to the UK," he notes. "We will definitely go to London, but other cities too."

Flydubai's 79-strong 737 fleet includes 46 Max 8 and three Max 9 jets. In 2021 it cut by 65 the total number of aircraft on order with Boeing to 186. While it is steadily replacing its NG variants with the Max, Ali Ghaith says delayed shipments will force it to retrofit its latest business class product on older-generation aircraft and keep some up to four years longer than their intended eight-year life.

"The problem is that aircraft that were meant to be delivered this year now won't be, and we are having to retain older aircraft," he says. "We have an aggressive plan to introduce as many Max variants as quickly as we can. Our biggest disappointment is that they are not coming as fast as we would like."

Flydubai has business class cabins on all its aircraft, but its newest come with 10 premium suites with

a sliding privacy door. Six aircraft - serving longer routes - will have the interior by the first quarter. Although its business class caters largely for Flydubai customers travelling for leisure but happy to pay for extra comfort, Ali Ghaith says it is also vital for codeshares with Emirates and others to work.

While Flydubai has a long-standing cross-selling pact with its sibling, both United Airlines and Air Canada have also this year extended their codeshare agreements with Emirates to include Flydubai. "It is a

fantastic opportunity to leverage the huge network, not just of Emirates, but also of two of the most important airlines in the world," says Ali Ghaith.

Route expansion is also on the cards for Flydubai, including into Africa - it has just launched Mombasa - and the former Soviet Union. "When I was with Emirates, it was all about east and west," says Ali Ghaith. "But going north is a big potential, and we are making that happen, including more destinations in Kazakhstan and Uzbekistan. We

also don't go to enough places in Africa."

Both carriers have rebounded impressively from the impact of the pandemic, recording strong profits in their latest financial results. Dubai's delayed Expo 2020 in 2021, together with last year's Qatar football World Cup, helped kickstart Flydubai's recovery and this has continued into the current year. "In the last six months we have seen the highest demand for traffic ever," says Ali Ghaith.

Over at Air Arabia, Ali says the airline has enjoyed "continuous growth" since countries began opening borders and welcoming tourists again. "There has been so much pent-up demand," he says, adding that, with "demand continuing to exceed supply across the market, yields are holding". Air Arabia has maintained load factors of more than 80% this year.

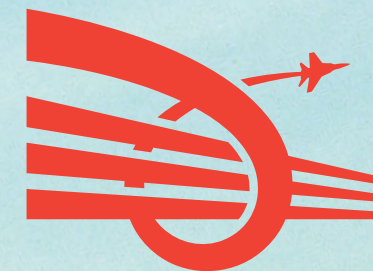
It remains to be seen whether either airline will add to its orderbook at the upcoming Dubai air show in November, although Ali Ghaith has previously hinted that he is attracted to the A321LR, which with around 500nm additional range and able to carry around 30 more passengers than the Max 8 could open new route opportunities.

As for the futures of the long-standing low-cost leaders who have led their respective airlines since they took to the skies, Ali Ghaith has been tipped to replace 73-year-old Emirates boss Sir Tim Clark when he retires. Meanwhile, Ali insists he has no plans to quit. "This is my enjoyment," he says. "The day it turns into a job is the day I will step aside." ▶



Ali: The day leading Air Arabia turns into a job, I will quit

BillyPax



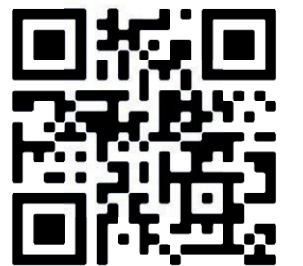
BAHRAIN INTERNATIONAL
AIRSHOW
IN ASSOCIATION WITH FARNBOROUGH INTERNATIONAL

TAKE YOUR BUSINESS TO NEW HEIGHTS IN THE MIDDLE EAST.

Join aerospace leaders from around the world at the gateway to the Middle East for an unmissable opportunity to meet new business connections, network with high-level delegations and discuss the industry's biggest topics in a prestigious environment.

13 - 15 November 2024

Sakhir Airbase, Kingdom of Bahrain



Visit
airshow.bh
for more information

Three of the Middle East's big MRO providers are set for expansion as they invest in new programmes and bricks and mortar



Etihad Engineering has built a reputation as an A380 specialist

Maintaining an advantage

Murdo Morrison

The pandemic may have put progress on the blocks for two years, but the Middle East's ambitious third-party maintenance, repair and overhaul houses are very much in growth mode, investing heavily in infrastructure, technology, and talent as airlines in the region take delivery of new types, twin-aisle fleets return to service, and demand

for widebody freighter conversions continues.

"We've been extremely busy this year," says David Doherty, vice-president commercial at Etihad Engineering, the region's largest third-party MRO provider. "We've cleared the decks of aircraft that were parked here during the pandemic, and we're now into a growth phase that was planned pre-Covid."

This year, the company carried out 1.7 million hours of touch labour

and is targeting two million in 2024. Plans include new infrastructure at the 550,000sq m (5,920,000sq ft) campus next to Abu Dhabi's main airport, with additional hangars that will take aircraft bays from 16 to 24 by 2027. The site already includes 66,000sq m of hangarage, with Hangar 6, large enough to accommodate three Airbus A380s.

Part of the expansion will see the creation of two – and possibly eventually four – Boeing 777-300ER passenger-to-freighter (P2F) lines,

as part of a partnership between the Abu Dhabi company and Israel Aerospace Industries. IAI and lessor GECAS – later acquired by AerCap – launched the P2F programme in 2019.

Under the agreement, IAI will hold the supplemental type certificate (STC) and Etihad Engineering will act as integrator. Doherty expects the first aircraft to arrive early next year, dependent on STC approval. Staff have been to Tel Aviv for training.

For industry-leading aviation news, opinion, and analysis, subscribe to FlightGlobal Premium.



Reasons to join FlightGlobal Premium:

- Unlimited access to FlightGlobal.com articles providing breaking news, industry analysis, and expert opinion
- Award-winning journalism and exclusive interviews with industry leaders
- Print and digital copies of *Flight International* magazine delivered monthly
- Subscriber-only Daily Briefing email with the latest news
- Digital quarterly copies of *Airline Business* magazine

FlightGlobal
PREMIUM

Subscribe now at:
www.flightglobal.com/subscribe

Bespoke corporate subscriptions packages available for 5 or more users. Please contact joseph.henrit@flightglobal.com for more information.



Joramco is making its first foray into the P2F market

Etihad Engineering has built a name as an Airbus A380 specialist. Just before Covid-19, the company carried out the world's first 12-year check on an A380 for an undisclosed flag carrier airline. In June, Etihad Engineering followed that with a six-year heavy check on the initial Etihad Airways A380 to return to service post-pandemic.

Despite production ending, Doherty believes the world's largest airliner will remain lucrative for Etihad Engineering, with almost three-quarters of the pre-Covid fleet back in service. In total, widebodies make up 80% of the company's throughput, with A350s and A330s, as well as Boeing 777s, 787s, and 767s being regular visitors. "We build our budget around widebodies," he says.

Etihad Engineering is broadening its portfolio in other ways. In March, it announced a letter of intent with Collins Aerospace to establish a nacelle and thrust reverser "centre of excellence" at its Abu Dhabi facility. Although a contract has to be agreed, the move will mean Etihad Engineering will be able to "work beyond the standard repair manual" and into "OEM-approved solutions", says Doherty.

Additive manufacturing, mainly of replacement interior parts for galleys, seats, and lavatories, is another growth area, and reflects the increasing popularity of quick part replacement. Since acquiring its first 3D printing machine in 2019, Etihad Engineering has produced more than 10,000 3D-printed parts every year. These parts range from individual units to batches of up to 300.

"We are fully embracing 3D printing and starting to see its financial benefit," comments Mohd Aizat, manager design, engineering, and innovation, as he shows off the company's latest EOS selective laser sintering machine, which has doubled Etihad Engineering's additive manufacturing capacity.

Although a recent restructuring of Abu Dhabi state-owned assets means Etihad Engineering is no longer a division of its sister airline, Etihad Airways remains a major client, representing about 40% of

the MRO specialist's business in recent years. While this proportion has been falling as Etihad renews its fleet, the airline plans to grow the fleet again, "giving us a fantastic growth platform", says Doherty.

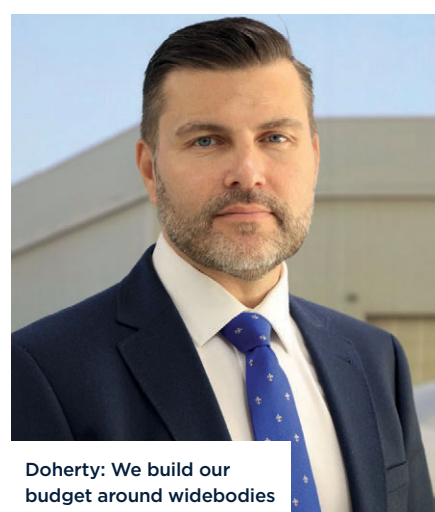
He stresses that Etihad Airways gets no preferential treatment. "Customers appreciate our ability to deliver world class support," says Doherty. "Any suggestion that we don't treat all our customers the same or if they think their aircraft is going to play second fiddle is simply not true and is evident in our wide mix of third-party work and customers from around the world."

Etihad Engineering's neighbour, engine MRO Sanad, was part of Etihad Engineering until nine years ago as Abu Dhabi Aerospace Technologies, and before that GAMCO, which was established on the site in 1987. When the airframe business was moved to Etihad Airways, the engine division was retained by state investment group Mubadala and renamed firstly TS&S, and then Sanad in 2019.

Like its former stablemate, Sanad has enjoyed a strong bounce-back since the pandemic, benefiting from what group chief executive Mansoor Janahi calls its "diversified portfolio of mid- to mature" programmes, including the 787's GE Aerospace GENx, the Rolls-Royce Trent 700 that powers the Airbus A330, and the International Aero Engines V2500, fitted to around half of all



Janahi: Diversified portfolio of mid to mature programmes



Doherty: We build our budget around widebodies

A320ceo aircraft.

At Paris, it signed an 11-year agreement with GE and Safran – owners of CFM International – to become the first full MRO provider in South Asia, Middle East and North Africa on the Leap-1A and Leap-1B, which power the Airbus A320neo family and Boeing 737 Max, respectively. It already had a deal with GE for "quick turn" overhauls on the Leap, but this was its first partnership with Safran.

Janahi describes the move as a "significant opportunity" for Sanad, given the "high-penetration" of latest-generation narrowbodies in the Middle East. It builds on a long relationship with GE. A decade ago, ADAT, as it was, became one of the first GENx shops outside the GE network, and, as the engine matures after 12 years of 787 service, it will continue as a profitable programme for Sanad, he says.

The company is also the only full Trent 700 shop outside the Rolls-Royce network, following a deal announced at the 2019 Paris show that added to its offering on the A330 engine. On the V2500, has also recently carried out work for American Airlines, the first time a US carrier has used an MRO provider for engine work in the Middle East, says Jahani.

This year, Sanad expects to carry out 139 engine jobs, up from 121 last year. In five years, Janahi expects to reach an annual total of 200, with

Leap and V2500 accounting for about 30% each, and Trent 700 and GENx sharing the remainder. He is also looking at "natural adjacencies" such as moving into auxiliary power units.

Janahi is also keen to "export our services" beyond the UAE. "We are surrounded by strong markets, including India, Eastern Europe and Africa, and partnering with local companies resonates with how we want to do business," he says. In 2022, Sanad signed a "preliminary agreement" with Indonesia's GMF to set up an engine MRO centre in that country.

In Jordan, Joramco – the MRO owned by aircraft lessor Dubai Aerospace Enterprise – also has big ambitions that include building two hangars to house a P2F conversion line and a paint facility capable of housing a widebody or two narrowbodies at its site at Queen Alia airport in Amman. The company expects the first hangar to be operational next year and says the initiative will position it as "a global independent MRO providing a full one-stop-shop solution".

In August, Joramco revealed that a 737-800 Boeing Converted Freighter line would be its first foray into the P2F market in an agreement with the US manufacturer. Boeing's vice-president of engineering services Mike Doellefeld says the deal fits with the airframer's objective "to bring freighter conversion capacity closer to our customers".

Speaking that month, chief executive Fraser Currie said: "The new 737-800BCF capability we're bringing to our MRO is another milestone for Joramco. Our geographic location in Amman, our deep MRO experience, and the opportunity to work with DAE on their customers' requirements makes this a very exciting opportunity."

DAE acquired Joramco in 2016 after divesting its previous, US-based MRO subsidiary Standard Aero. According to DAE chief executive Firoz Tarapore, since then revenues have more than doubled, and the business will have 22 maintenance lines by the end of next year. ▶



FlightJobs

FlightJobs will take your career to the next level. We have hundreds of the best aviation roles to choose from.



Set up job alerts.

Receive relevant jobs in your inbox as soon as they appear.



Get headhunted.

Create a profile and upload your CV so potential employers can get in touch.



Careers news.

Get the latest news and advice from experts.

Create your free FlightJobs account at Jobs.flightglobal.com/register

Paras Dhamecha is the managing director of Empire Aviation, one of Dubai's leading business aviation providers. He describes how the group has been performing in the Gulf and beyond and why it is building a new HQ

Expanding Empire

Q How has the post-pandemic period been for Empire? How is this year going?

A This has been a fantastic year for Empire Aviation, across aircraft sales transactions as well as our charter bookings and revenue. There is strong international interest across all our services – aircraft management, aircraft sales, charter and CAMO [continuing airworthiness management organisation] – from various sources, including wealthy individuals/families, corporates, and government. We are registering high double-digit growth, year on year, and have grown revenues by more than 100% since the end of the pandemic.

Q You added a Boeing Business Jet to your fleet this year. What is your managed charter fleet today?

A Our charter fleet consists of the Boeing Business Jet, Bombardier Global 7500, three Global 6000s, one Gulfstream G650, two Embraer Legacy 650s, and one Legacy 600. Charter demand continues to be strong and we are seeing more interest in longer leasing periods.

Q Are your charter aircraft all under the UAE air operator certificate because you have AOCs in San Marino and India too?

A It's a combination. All our aircraft available for charter are registered under our UAE or San Marino AOC. We are also a charter broker and can arrange aircraft charter anywhere in the world and combine a private jet with partners in our Luxury Partner program (including some of the world's leading hotels at top destinations) to create the ultimate luxury leisure experience.

Q You have a Gulfstream sales representative agreement for India. How important is this for Empire?

A We started our role as Gulfstream's authorised Independent Sales Representative (ISR)

in India in 2021. We were delighted to be selected to represent a very strong and iconic global brand. I knew it was a significant step and we got a lot of positive feedback about this. We had already been working in India for many years and had had several Gulfstream aircraft on our managed fleet. Gulfstream was looking for a one-stop shop solution on the ground in India from an experienced team with a strong service focus to help manage clients and aircraft. We also brought market knowledge and good connections in the country. Since the pandemic, interest in the benefits of private aviation there has certainly grown and the market continues to be active. We have completed transactions in India.

Q You recently agreed to establish a base at the Mohammed bin Rashid Aerospace Hub (MBRAH) next to Dubai's second airport, Al Maktoum, and part of the Dubai South development. What is the purpose of this new site?

A The Middle East is among the fastest-growing aviation markets and we are investing in the MBRAH to develop a new, multipurpose commercial business aviation facility. The building has a prime location directly opposite the VIP terminal. This comprises the company's new global corporate headquarters, operations control and CAMO for all group

operations, crew check-in and briefing area. The facility also offers premium office space aimed at leading aviation industry companies and retailers – so, luxury retail food and beverage outlets – as well as a rooftop lounge for entertainment/events. The facility supports MBRAH's vision to make Dubai the aviation capital of the world. We anticipate breaking ground before the end of this year with the opening scheduled for around the end of 2024. ▶



Empire Aviation Group

Twenty-six years after launching its first satcoms business, the UAE has made a remarkable contribution to the sector. Now the countdown has begun to its most ambitious mission yet

Murdo Morrison

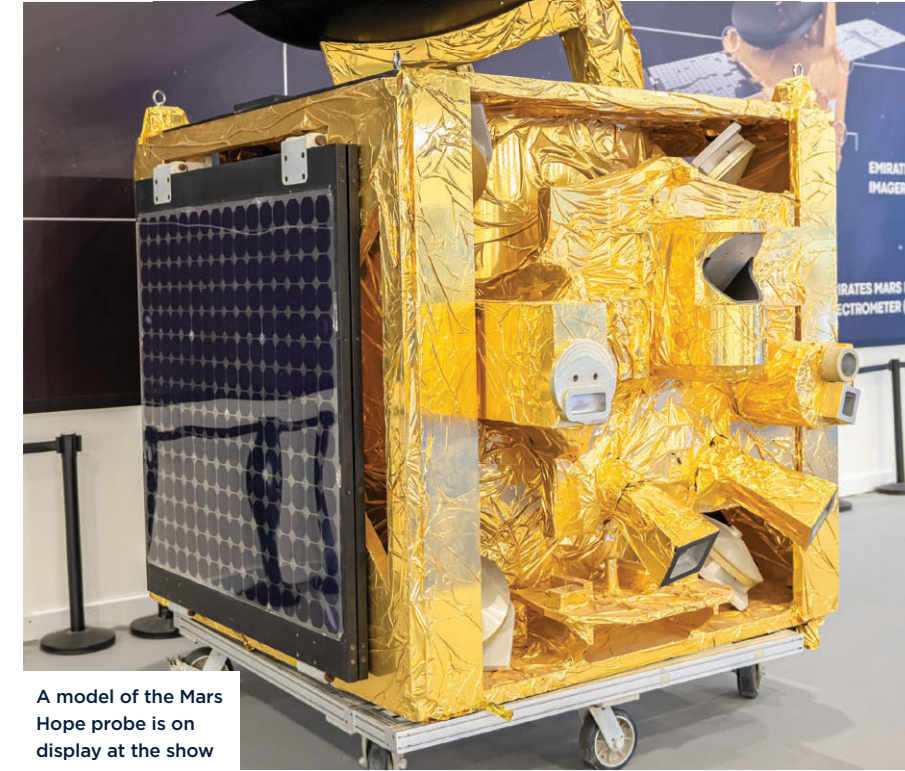
The United Arab Emirates has had quite a journey into the cosmos since setting up its first satellite telecommunications provider just a quarter of a century ago. As well as becoming a major player in satellite technology, the federation has ventured into space science and exploration, embarking on a Mars mission, landing a rover on the Moon (albeit not 100% successfully), and sending an astronaut to the International Space Station (ISS). In 2028, it plans to go further, launching a spacecraft to study the asteroid belt between Mars and Jupiter.

The UAE's motives in investing in the sector go beyond a desire for international kudos – fewer than a dozen countries can claim to be major space powers. It is part of the nation's long effort – going back almost to the founding of the union in 1971 – to diversify from a dependence on oil and develop a knowledge and services economy. "It is a catalyst for economic growth," asserts Her Excellency Sarah Al Amiri, minister of state for public education and advanced technology, who also chairs the UAE Space Agency.

For most of the 26 years that the UAE has been involved in spaceflight its efforts have been led by state-owned bodies, such as the Dubai-based Mohammad Bin Rashid Space Centre (MBRSC) and local satcoms champion Yahsat. However, the UAE Space Agency – established in 2014 to develop the national space sector – recognized that contracts from occasional big-ticket government programmes were not going to be enough to encourage start-ups into the industry, says His Excellency Ibrahim Al Qasim, its deputy director general.

One initiative to counter this has been the National Space Fund, an AED 3 billion (\$820 million) package to support Emirati companies in space engineering, science, and research. The first funded project will be a constellation of advanced imaging satellites using synthetic aperture radar for land-use and environmental monitoring. Named Sirb after the Arabic term for a flock of birds, the satellites will be built by a partnership of UAE public and private as well as international entities.

However, the other development that swayed many young Emiratis to become spaceflight entrepreneurs was the UAE's Mars mission. Announced in 2014, the Hope Probe took off in 2020 and reached the Red Planet in 2021, the UAE's 50th anniversary. "The Mars mission has helped create a generation of entrepreneurs who can serve the space industry, but also other sectors," says Al Qasim, who notes that those behind almost half the



A model of the Mars Hope probe is on display at the show

Satellites made in the UAE now cover more than 80% of the world's population and Yahsat is one of the global top 10 communications providers, notes Amiri.

The Mars mission – on which Amiri served as deputy project manager and science lead – was tasked with mapping the planet's atmosphere over a Martian year (687 days). It has made the UAE just the ninth country involved in Martian exploration. The 1,350kg probe itself was developed by the MBRSC with international partners, and funding has come from the UAE Space Agency. More than 1,000 days from launch, the probe is currently in Martian orbit.

Arguably less successful was the UAE's lunar mission, which launched in December 2022 on a SpaceX Falcon 9. The Rashid rover was meant to touch down on the moon in April and explore the Atlas crater. In the event, the Japanese-built lander carrying the rover lost contact in the final 10m of the descent and crashed. However, it remains the only Moon landing by an Arab country, and UAE vice president and Dubai ruler Sheikh Mohammed bin Rashid has pledged to launch a second mission, although a schedule has not been specified.

The UAE launched its astronaut programme in April 2017 to prepare an Emirati astronaut corps for scientific space exploration missions. Of the successful candidates, Hazzaa AlMansoori was chosen to be the country's – and the Arab region's – first representative on the ISS. AlMansoori, a former Lockheed Martin F-16 instructor pilot with the UAE air force, took off on 25 September 2019, conducting 31 scientific experiments while on board.

The UAE confirmed that the asteroid belt is its next flagship objective. A spacecraft – named MBR after Dubai's ruler – will study seven asteroids over seven years – its aim to find out more about the origins of life on Earth. Again, while scientific knowledge is the goal, Amiri, speaking in May, said the immediate benefit would be "the creation of viable and rewarding employment opportunities for young Emiratis for generations to come...The mission will contribute to empowering local private sector companies and start-ups."

The show's first UAE space pavilion is a sign the country now considers itself a heavyweight, with lots to offer international partners. The UAE Space Agency also hopes it will encourage more bright, young Emiratis to enter the industry or even launch their own space technology businesses. As Al Qasim notes: "There is no better sector to drive innovation. If you can build something for space, you can build it for any sector. And when it comes to challenges facing mankind like global warming, it is the source of many of the solutions." ▶

15 start-ups represented in the UAE space pavilion at the show are former Mars mission engineers.

However, in terms of pure economic impact, it is arguably the satellite sector that has been the biggest beneficiary of the UAE's

space endeavours. The country launched its first Earth observation satellite in 2009, and several others have followed. MBRSC is shortly to launch its MBZ-SAT, its latest satellite able to provide high-resolution imaging from space.

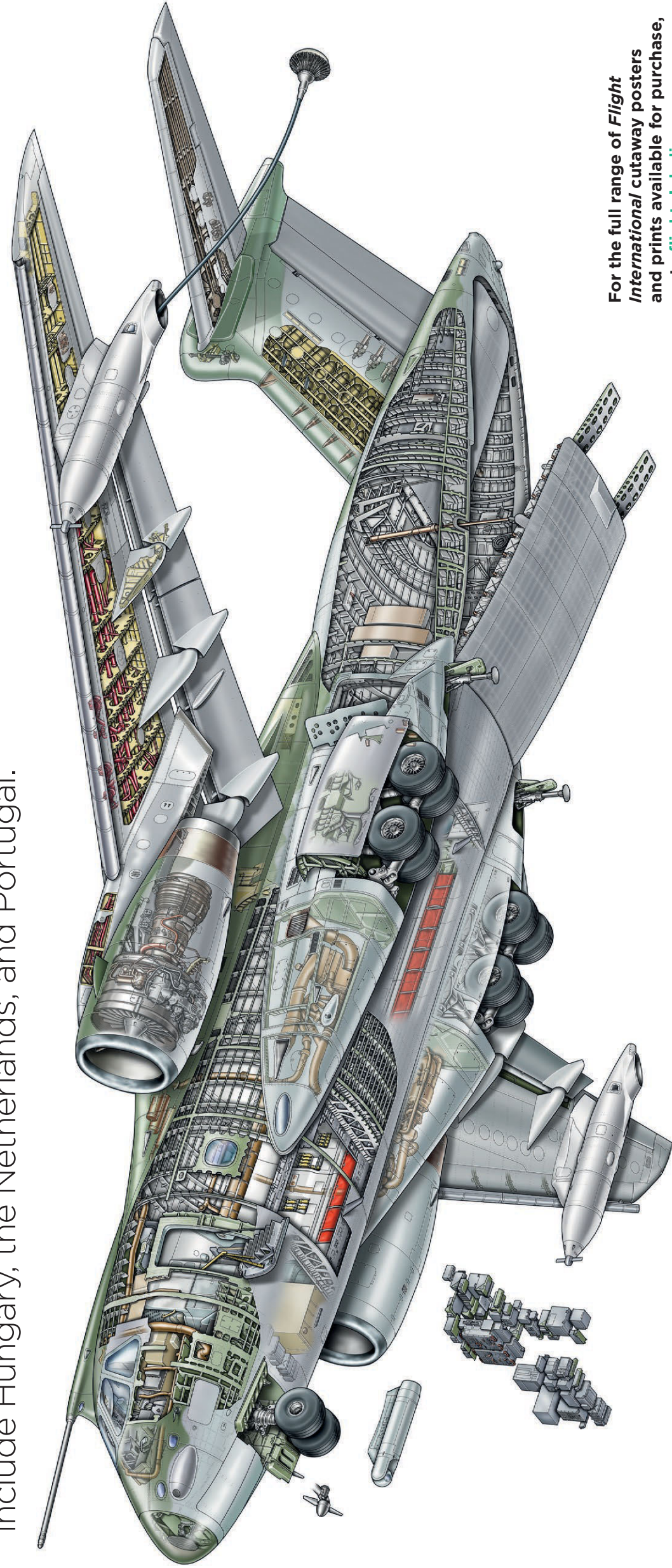


Al Qasim: There is no better sector than space for encouraging innovation

UAE Space Agency

Embraer KC-390

Featuring on the static display, the largest aircraft built by Embraer rolled out in 2014 (the year we published this cutaway). It flew in 2015 and entered service with the Brazilian air force in 2019. The tanker-transport is powered by two IAE V2500-E5 engines. Customers include Hungary, the Netherlands, and Portugal.

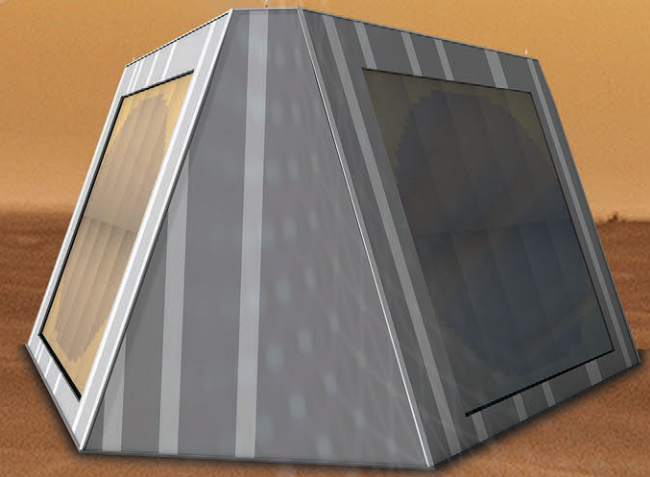


For the full range of *Flight International* cutaway posters and prints available for purchase, go to flightglobalimages.com

Cutaway drawing by Tim Hall



PARTNERING FOR SECURITY AND PROSPERITY.



LOCKHEED MARTIN 

HOW DO YOU BOOST ENGINE EFFICIENCY WITH ELECTRICAL POWER?

We're taking smarter steps toward a greener future. By investing in hybrid-electric propulsion, developing systems that operate on SAF fuels, and partnering to explore innovations like novel wing designs, Collins Aerospace and Pratt & Whitney are creating a safer, more connected world—and protecting it for generations to come.

See our progress and learn more at [RTX.com/WeAreRTX](https://www.rtx.com/WeAreRTX)



COLLINS AEROSPACE | PRATT & WHITNEY | RAYTHEON